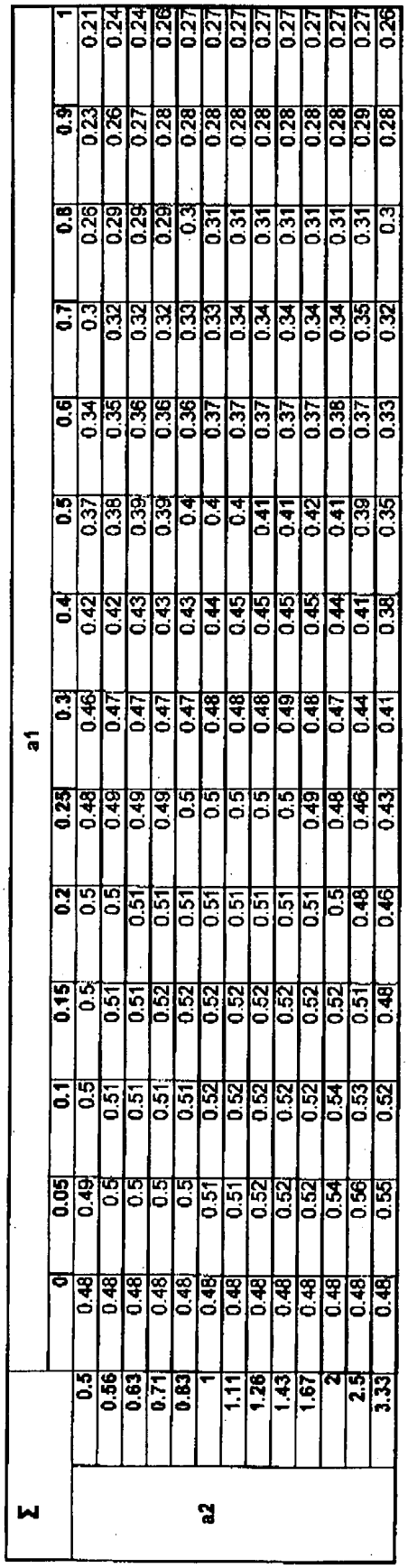
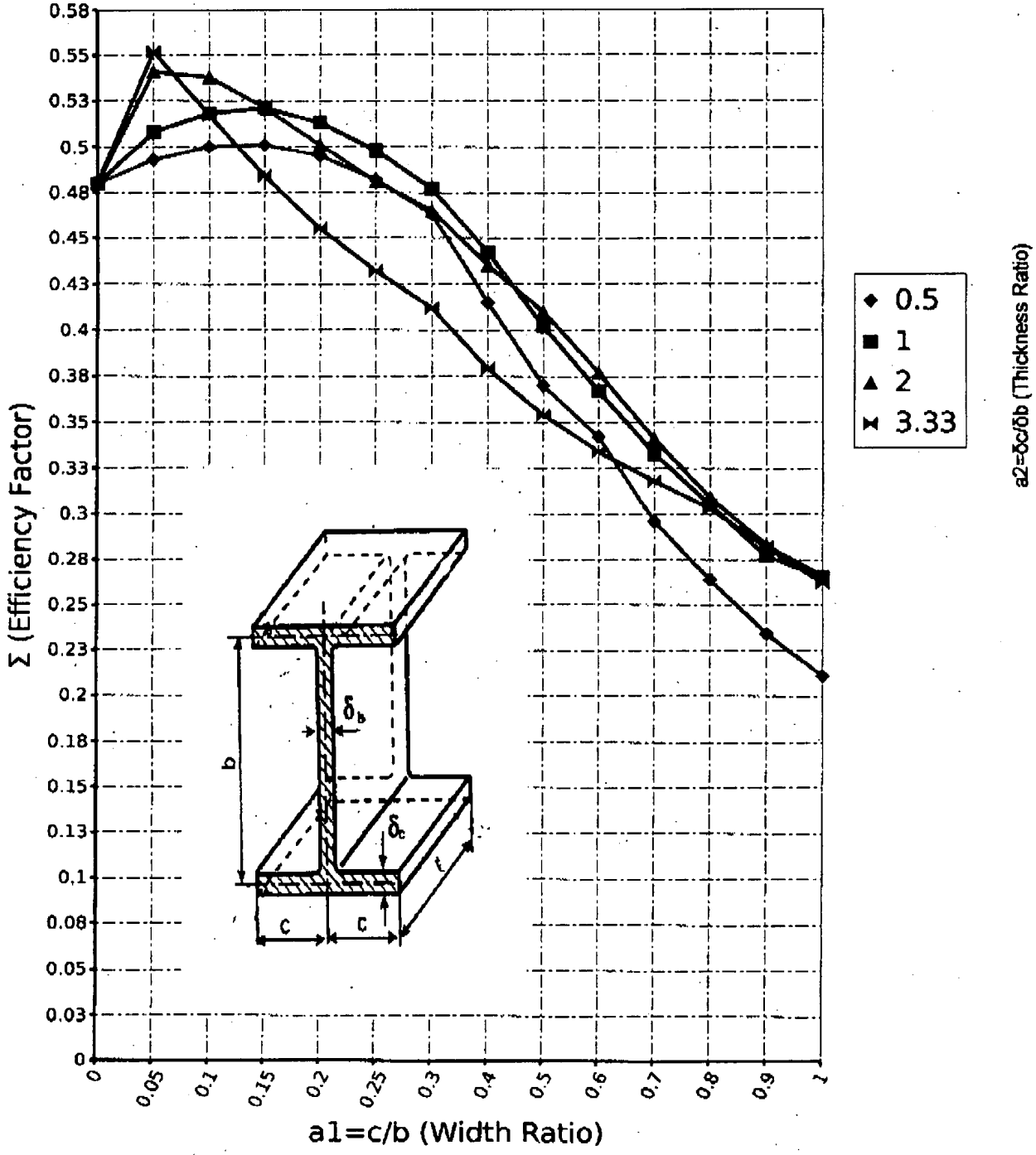
(2)

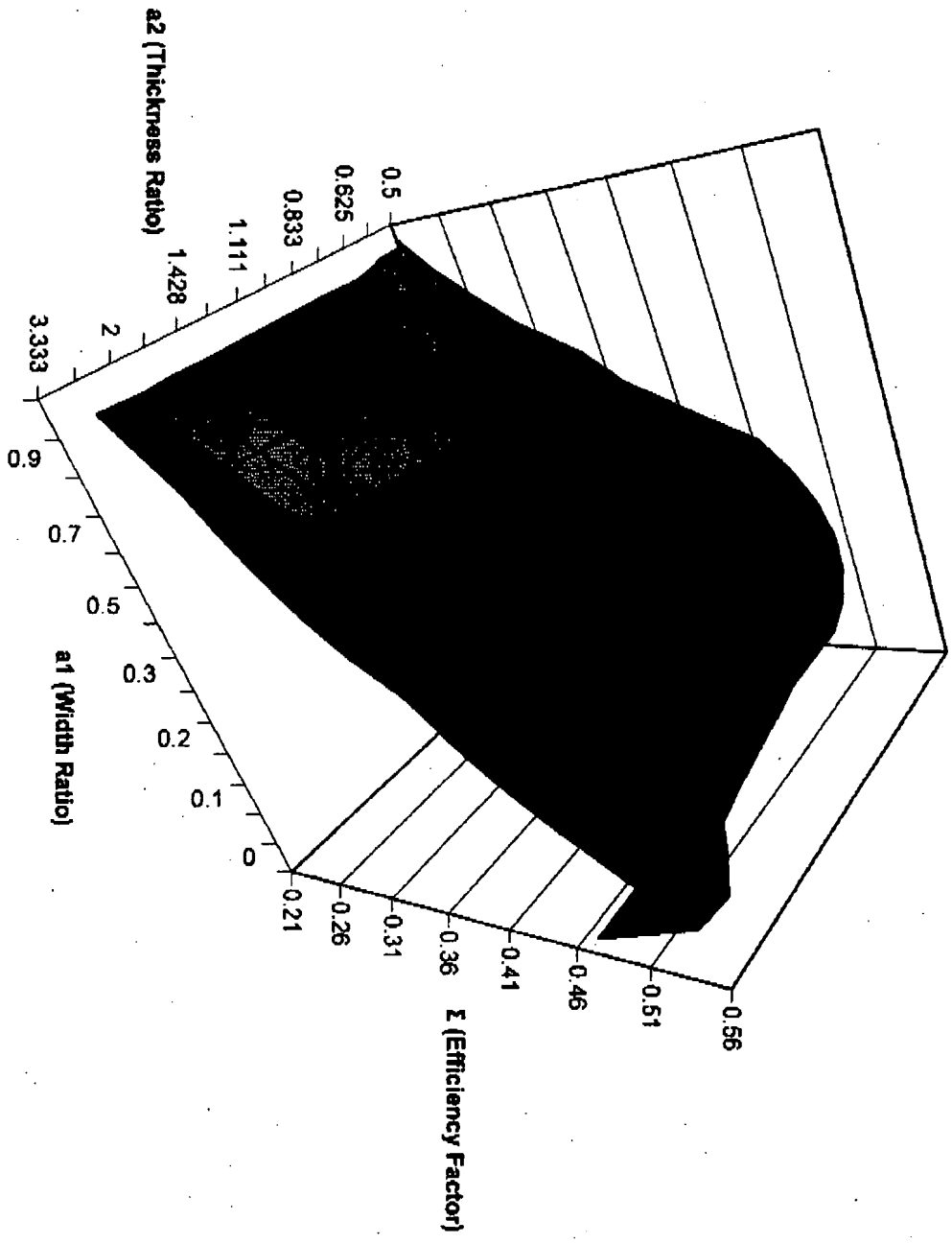


Σ	a2 \ a1	0	0.05	0.1	0.15	0.2	0.25	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
	0.5	0.48	0.49	0.5	0.5	0.5	0.48	0.46	0.42	0.37	0.34	0.3	0.26	0.23	0.21
	0.56	0.48	0.5	0.51	0.51	0.5	0.49	0.47	0.42	0.38	0.35	0.32	0.29	0.26	0.24
	0.63	0.48	0.5	0.51	0.51	0.51	0.49	0.47	0.43	0.39	0.36	0.32	0.29	0.27	0.24
	0.71	0.48	0.5	0.51	0.52	0.51	0.49	0.47	0.43	0.39	0.36	0.32	0.29	0.28	0.26
	0.83	0.48	0.5	0.51	0.52	0.51	0.5	0.47	0.43	0.4	0.36	0.33	0.3	0.28	0.27
	1	0.48	0.51	0.52	0.52	0.51	0.5	0.48	0.44	0.4	0.37	0.33	0.31	0.28	0.27
	1.11	0.48	0.51	0.52	0.52	0.51	0.5	0.48	0.45	0.4	0.37	0.34	0.31	0.28	0.27
	1.26	0.48	0.52	0.52	0.52	0.51	0.5	0.48	0.45	0.41	0.37	0.34	0.31	0.28	0.27
	1.43	0.48	0.52	0.52	0.52	0.51	0.5	0.49	0.45	0.41	0.37	0.34	0.31	0.28	0.27
	1.67	0.48	0.52	0.52	0.52	0.51	0.49	0.48	0.45	0.42	0.37	0.34	0.31	0.28	0.27
	2	0.48	0.54	0.54	0.52	0.5	0.48	0.47	0.44	0.41	0.38	0.34	0.31	0.28	0.27
	2.5	0.48	0.56	0.53	0.51	0.48	0.46	0.44	0.41	0.39	0.37	0.35	0.31	0.29	0.27
	3.33	0.48	0.55	0.52	0.48	0.46	0.43	0.41	0.38	0.35	0.33	0.32	0.3	0.28	0.26

(3)

Efficiency Factor Σ for Thickness Ratios (a2) versus Width Ratio (a1). Double-T Shapes.





Efficiency Factor Σ versus Thickness Ratios (a2) and Width Ratio (a1), for Double T Shape.

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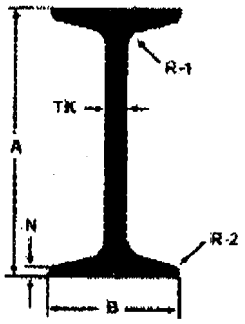

DEPTH A	FLANGE B	WEB TK	R	R1	R2	EST. WT. /FT.	NOMINAL PACKAGING BUNDLE WT.	PCS.	SECTION NO.
3.000	2.500	.170	.170	.270	.125	1.963	483	10	851A
3.000	2.500	.170	.170	.270	.100	2.595	518	8	851D
4.000	2.660	.190	.190	.290	.110	2.644	536	8	851B
4.000	2.660	.190	.190	.290	.110	3.284	506	6	851F
5.000	3.330	.230	.230	.330	.140	4.303	1066	10	851K
5.000	3.330	.230	.230	.330	.140	5.054	1004	8	851L
6.000	3.660	.270	.270	.370	.160	6.348	970	6	851G
6.000	3.660	.350	.350	.450	.210	10.993	1096	4	851T

Structural Shapes

TWPM
Double-T Shape

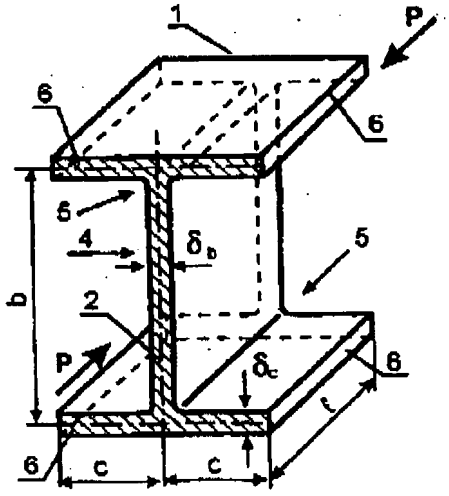

FIG.3

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(PAGE 1 OF 4)

Alcoa Structural I-Beams, American Standard vs. Optimum Weight Structural Element (OWSE)

SECTION	ALLOY	INTENSITY* (LB/INCH^2)	SIZE, INCHES A	B	TK	N	EST. WT/FT(LB)	WEIGHT REDUCTION (%)
851A	6061-T6		3.000	2.330	0.170	0.170	2.185	
OWSE (for 851A)	6061-T6	14.0	5.052	1.427	0.148	0.288	1.817	16.880
		12.0	5.089	1.440	0.144	0.289	1.793	17.187
		10.0	5.116	1.451	0.140	0.281	1.755	18.939
		8.0	5.143	1.462	0.135	0.270	1.704	21.272
		6.0	5.000	1.425	0.124	0.249	1.529	29.345
	6082-T6	14.0	4.983	1.402	0.145	0.290	1.753	19.031
		12.0	4.992	1.413	0.142	0.283	1.728	20.281
		10.0	5.009	1.420	0.137	0.275	1.682	22.299
		8.0	4.973	1.414	0.131	0.261	1.593	26.395
		6.0	4.832	1.378	0.120	0.241	1.429	34.608
851B	6061-T6		4.000	2.660	0.190	0.190	2.040	
OWSE (for 851B)	6061-T6	14.0	5.119	1.446	0.160	0.299	1.868	8.597
		12.0	5.220	1.477	0.148	0.298	1.887	7.489
		10.0	5.316	1.507	0.146	0.291	1.894	7.173
		8.0	5.384	1.530	0.142	0.283	1.867	8.469
		6.0	5.487	1.568	0.136	0.272	1.829	10.366
	6082-T6	14.0	5.072	1.433	0.148	0.296	1.830	10.272
		12.0	5.179	1.485	0.147	0.294	1.857	8.959
		10.0	5.274	1.498	0.145	0.289	1.868	8.560
		8.0	5.336	1.517	0.140	0.280	1.834	10.098
		6.0	5.407	1.541	0.135	0.268	1.788	12.332
851F	6061-T6		4.000	2.796	0.328	0.190	2.710	
OWSE (for 851F)	6061-T6	14.0	5.838	1.649	0.171	0.341	2.424	10.564
		12.0	5.881	1.664	0.167	0.334	2.395	11.613
		10.0	5.931	1.682	0.163	0.325	2.359	12.975
		8.0	5.986	1.702	0.157	0.315	2.309	14.812
		6.0	6.046	1.724	0.150	0.301	2.237	17.474
	6082-T6	14.0	5.770	1.630	0.169	0.337	2.369	12.580
		12.0	5.808	1.643	0.165	0.330	2.336	13.819
		10.0	5.848	1.656	0.160	0.321	2.293	15.406
		8.0	5.890	1.674	0.155	0.310	2.235	17.535
		6.0	5.927	1.690	0.149	0.296	2.149	20.693

* Note: Intensity = (Compressive Force)/(Length^2). Intensity for aviation structures lies in the range 2.84 –14.2 lb/inch^2

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(PAGE 2 OF 4)

Alcoa Structural I-Beams, American Standard vs. Optimum Weight Structural Element (OWSE)

SECTION	ALLOY	INTENSITY* (LB/INCH^2)	SIZE, INCHES b	c	δb	δc	a1 (=c/b)	a2 (=δc/δb)
851A	6061-T6		2.83	1.17	0.17	0.17	0.41	1
OWSE (for 851A)	6061-T6	14.0	4.78	0.71	0.15	0.3	0.15	2
		12.0	4.8	0.72	0.14	0.29	0.15	2
		10.0	4.84	0.73	0.14	0.28	0.15	2
		8.0	4.87	0.73	0.14	0.27	0.15	2
		6.0	4.75	0.71	0.12	0.25	0.15	2
	6082-T6	14.0	4.67	0.7	0.14	0.29	0.15	2
		12.0	4.71	0.71	0.14	0.28	0.15	2
		10.0	4.73	0.71	0.14	0.27	0.15	2
		8.0	4.71	0.71	0.13	0.26	0.15	2
		6.0	4.59	0.69	0.12	0.24	0.15	2
851B	6061-T6		3.81	1.33	0.19	0.19	0.35	1
OWSE (for 851B)	6061-T6	14.0	4.82	0.72	0.15	0.3	0.15	2
		12.0	4.92	0.74	0.15	0.3	0.15	2
		10.0	5.02	0.75	0.15	0.29	0.15	2
		8.0	5.1	0.77	0.14	0.28	0.15	2
		6.0	5.19	0.78	0.14	0.27	0.15	2
	6082-T6	14.0	4.78	0.72	0.15	0.3	0.15	2
		12.0	4.88	0.73	0.15	0.29	0.15	2
		10.0	4.99	0.75	0.14	0.29	0.15	2
		8.0	5.06	0.76	0.14	0.28	0.15	2
		6.0	5.14	0.77	0.13	0.27	0.15	2
851F	6061-T6		3.81	1.4	0.33	0.19	0.37	0.58
OWSE (for 851F)	6061-T6	14.0	5.5	0.82	0.17	0.34	0.15	2
		12.0	5.55	0.83	0.17	0.33	0.15	2
		10.0	5.61	0.84	0.16	0.33	0.15	2
		8.0	5.67	0.85	0.16	0.31	0.15	2
		6.0	5.75	0.86	0.16	0.3	0.15	2
	6082-T6	14.0	5.43	0.81	0.17	0.34	0.15	2
		12.0	5.48	0.82	0.16	0.33	0.15	2
		10.0	5.53	0.83	0.16	0.32	0.15	2
		8.0	5.58	0.84	0.15	0.31	0.15	2
		6.0	5.63	0.84	0.15	0.3	0.15	2

* Note: Intensity = (Compressive Force)/(Length^2). Intensity for aviation structures lies in the range 2.84 –14.2 lb/inch^2

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Alcoa Structural I-Beams, American Standard vs. Optimum Weight Structural Element (OWSE)

SECTION	ALLOY	INTENSITY* (LB/INCH^2)	SIZE, INCHES				EST. WT/FT(LB)	WEIGHT REDUCTION (%)
			A	B	TK	N		
851G	6061-T6		8.000	4.000	0.270	0.270	4.995	
OWSE (for 851G)	6061-T6	14.0	7.678	2.169	0.224	0.449	4.196	**15.998**
		12.0	7.831	2.216	0.222	0.444	4.246	**14.978**
		10.0	8.020	2.274	0.220	0.440	4.312	**13.674**
		8.0	8.264	2.349	0.217	0.434	4.400	**11.913**
		6.0	8.603	2.452	0.214	0.428	4.528	**9.339**
	6082-T6	14.0	7.543	2.131	0.220	0.441	4.049	**18.934**
		12.0	7.702	2.180	0.219	0.437	4.108	**17.747**
		10.0	7.900	2.240	0.217	0.433	4.184	**16.222**
		8.0	8.158	2.319	0.214	0.429	4.288	**14.157**
		6.0	8.518	2.428	0.212	0.424	4.439	**11.125**
851T	6061-T6		12.000	5.000	0.350	0.350	8.911	
OWSE (for 851T)	6061-T6	14.0	10.212	2.885	0.298	0.597	7.421	**16.720**
		12.0	10.415	2.947	0.296	0.591	7.511	**15.711**
		10.0	10.666	3.024	0.292	0.585	7.626	**14.418**
		8.0	10.991	3.124	0.289	0.578	7.782	**12.672**
		6.0	11.442	3.262	0.285	0.569	8.009	**10.120**
	6082-T6	14.0	10.023	2.831	0.293	0.586	7.149	**19.772**
		12.0	10.235	2.896	0.290	0.581	7.254	**18.597**
		10.0	10.498	2.977	0.288	0.576	7.388	**17.088**
		8.0	10.840	3.081	0.285	0.570	7.571	**15.044**
		6.0	11.319	3.227	0.282	0.563	7.838	**12.043**

* Note: Intensity = (Compressive Force)/(Length^2). Intensity for aviation structures lies in the range 2.84 –14.2 lb/inch^2

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Allcoa Structural I-Beams, American Standard vs. Optimum Weight Structural Element (OWSE)

SECTION	ALLOY	INTENSITY* (LB/INCH^2)	SIZE, INCHES b	c	δb	δc	a1 (=c/b)	a2 (=δc/δb)
851G	6061-T6		7.73	2	0.27	0.27	0.26	1
OWSE (for 851G)	6061-T6	14.0	7.23	1.08	0.22	0.45	0.15	2
		12.0	7.39	1.11	0.22	0.44	0.15	2
		10.0	7.58	1.14	0.22	0.44	0.15	2
		8.0	7.83	1.17	0.22	0.43	0.15	2
		6.0	8.17	1.23	0.21	0.43	0.15	2
	6082-T6	14.0	7.1	1.07	0.22	0.44	0.15	2
		12.0	7.27	1.09	0.22	0.44	0.15	2
		10.0	7.47	1.12	0.22	0.43	0.15	2
		8.0	7.73	1.16	0.21	0.43	0.15	2
		6.0	8.09	1.21	0.21	0.42	0.15	2
851T	6061-T6		11.65	2.5	0.35	0.35	0.21	1
OWSE (for 851T)	6061-T6	14.0	9.62	1.44	0.3	0.6	0.15	2
		12.0	9.82	1.47	0.3	0.59	0.15	2
		10.0	10.08	1.51	0.29	0.58	0.15	2
		8.0	10.41	1.56	0.29	0.58	0.15	2
		6.0	10.87	1.63	0.28	0.57	0.15	2
	6082-T6	14.0	9.44	1.42	0.29	0.59	0.15	2
		12.0	9.65	1.45	0.29	0.58	0.15	2
		10.0	9.92	1.49	0.29	0.58	0.15	2
		8.0	10.27	1.54	0.28	0.57	0.15	2
		6.0	10.76	1.61	0.28	0.56	0.15	2

* Note: Intensity = (Compressive Force)/(Length^2). Intensity for aviation structures lies in the range 2.84 --14.2 lb/inch^2